

CANADIAN ARCHITECT AND BUILDER.

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—THE—
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ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS,
DECORATORS, BUILDERS, CONTRACTORS, AND MANU-
FACTURERS OF AND DEALERS IN BUILDING
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Prices for advertising sent promptly on application. Orders for advertising should reach the office of publication not later than the 12th day of the month, and changes of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of technical value to the persons in whose interests this journal is published, are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

The "Canadian Architect and Builder" is the official paper of the Architectural Associations of Ontario and Quebec.

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In a recent letter to the city in reference to the court house question, Messrs. Neelon & Co.'s solicitors state that labor and materials are very perceptibly lower at the present time than they were in 1888. This is incorrect, in fact the movement is the other way. Stone-cutters who received 38 cents per hour in that year are now getting the high wage of 43 cents, and bricklayers now receive 35 against 33½ cents per hour in 1888. The material market also shows some prices to have risen, and stone, the material more particularly referred to, is 20 per cent. dearer than at that time.

WE had the pleasure of presenting to our readers some months since a brief paper on "The Doorway," originally presented by Mr. Gemmell for the consideration of the members of the Toronto Architectural Guild. It was intended to serve as the introduction to a series of brief papers by members of the Guild on the subject of house design. It will be a matter of regret to our readers to be informed that the further consideration by the Guild of this interesting subject was conducted orally, and the results are consequently in a measure lost.

THERE is room for much improvement in the efficiency of electric door bells as in many instances they are fitted up. It is not an infrequent thing to see posted above the push button beside a residence door, the intimation: "Bell out of order; please knock!" It sometimes happens, as in the case of a prominent Toronto merchant, recently, that considerable time elapses before the inmates of the house become aware that the door bell is failing to discharge its duty. The merchant's friends in vain had been pushing the button for a week or more. When at last the discovery was made that the bell was not working, the owner went down town and expended \$3.50 in repairs. What was his regret at having done so when the first person to demand admittance after the bell had been put in order was a policeman bearing a warrant summoning him to the police court to show cause why he had not removed the snow from the sidewalk in front of his premises.

THE Ministers of Finance and Customs are at present receiving deputations representing the various important manufacturing and commercial interests of the country for the purpose of learning what readjustment of the existing tariff is required. The present may therefore not be an inopportune time to mention that architects have reasonable ground for complaint in this connection. Few if any of their supplies are or ever will be manufactured in Canada. Even the United States has thus far been able to produce only the cheaper grades of drawing paper and instruments. In view of these conditions, the duty of 25 to 35 per cent. imposed upon these materials when imported into this country from Europe must be considered unnecessarily burdensome. It might very properly be reduced by at least 50 per cent. Canadian architects at present find themselves in the unfortunate position of being highly taxed on everything they require to use, while virtually the tariff does not protect them from the competition of foreign architects.

In the construction of elevator shafts and the fitting up of elevators, architects would do well to see that a space of five to seven feet at least is provided between the top of the elevator when it reaches its highest point of travel and the roof of the shaft. The necessity for such a requirement was brought to our attention by an accident which happened recently. The automatic regulating device connected with an electric elevator failed to operate when the current was turned on, and the car shot up the shaft. Fortunately it was empty, and more fortunately still, two attendants who a moment before were on the top of the car for the purpose of oiling the slides, had made their exit from the shaft. If the accident had occurred one minute earlier these men must have been crushed to death at the top of the shaft, as the stopping point of the car is only two or three feet below the roof. This is not the first occurrence of the kind that has come to our notice. In addition to the necessary provision above mentioned, the safety of passengers demands that the controlling devices be made more effective.

THE York Pioneers have taken in hand the erection of a monument to Governor Simcoe, and the Ontario Government will be asked to grant a suitable site for the same in Queen's Park, Toronto. It is very desirable that the memory of the man who founded the Queen City of Canada and caused it to be made the seat of legislation for Ontario, should be perpetuated in the manner proposed. The time also is most appropriate, as the present month marks the centennial of the founding of the city. If a suitable site be granted, as we have no doubt will be the case, the York Pioneers will make every effort to erect a statue which shall be recognized as a work of art, and a deserving memorial of one of the greatest pioneers of Canadian civilization.

AN international congress of architects is to be held in Chicago under the auspices of the World's Congress Auxiliary, during the week commencing July 31st. The object is stated to be to bring together the eminent architects of all countries for friendly intercourse, comparison of methods and results, and the promotion of their mutual interests in the profession. The following subjects have been selected for consideration at this congress:—Workingmen's Houses; Modern Department Houses; Ancient Department Houses; Laundries in Houses, Health Effect; Modern Stables, large and small; Responsibility of Architects in Constructional Matters; Responsibility of Architects as to Plans; Responsibility of Architects in Decorative Matters; Sculpture and Architecture; Painting and Architecture; The Client's Right to Service, as to Drawings; Ownership of Same, Specifications and Details, as to Supervision, etc.; Mechanical Engineering in Architecture, and the Architect's Responsibility Therefor; Modern Steel Construction; Fire-Proofing of Buildings to Date.

THE public works department at Ottawa are evidently anxious to protect themselves from a class of undesirable contractors, and in order to do this have issued new regulations regarding Government contracts. In future the deposited cheque is to be 10 instead of 5 per cent. on the amount of contract, and only 80 in place of 90 per cent. will be paid on progress estimates. This new arrangement may be the means of keeping smaller contractors from competing for the work, but if a contractor has the confidence of his employer there is no reason why restrictions of any large amount should be placed on his progress certificates. During the erection of the Ontario Parliament Buildings payments on account to the contractors were made to the amount of 90 per cent. on the value of the work executed, and the work financially has been carried out in a satisfactory manner. Larger amounts than 20 per cent. are often kept back by architects upon progress certificates, but it has often been the means of retarding the progress of works even in the hands of honest contractors.

WE had occasion recently to refer to the unfair treatment accorded by the Toronto city council to Mr. Alex. Gartshore, of Hamilton, whose tender for water pipe, being the lowest, was rejected in favor of a higher tender by a local firm. The sequel to this piece of injustice now appears in Mr. Gartshore's refusal to again submit a tender for material required by the city of Toronto when invited to do so. In consequence of this refusal only a single tender was received. It is a short-sighted policy for corporations to exclude the competition of outside contractors. By doing so they are compelled to pay higher prices for work and material, and as gradually the impression gets abroad that no outsider need apply, the local contractors are enabled to combine and have things all their own way. In the case to which we have referred, however, outside contractors were led to submit tenders on invitation of the Board of Works in the belief that the Council would deal with the same impartially and on their merits. Their confidence in this regard having been disappointed, as honorable men they very properly refuse to again be made dupes of.

IT was not without a feeling of regret that we read the letter of Mr. Gregg, in our last issue, announcing the dissolution of the Toronto Architectural Club, formerly the Toronto Architectural Sketch Club. This regret will be shared by many of our readers who have themselves been benefited by connection with the Club, or who are familiar with the work it achieved. The many valuable papers read by specialists on various subjects at the Club meetings during the last four or five years, were instructive not only to the members, but also through their subsequent publication in these columns, to a large constituency outside. Several competitions took place each season with results which were creditable to those taking part and highly beneficial to students and others both in and out of the Club's membership. It is most desirable that the good work of this organization should by some means be perpetuated. The existence of several local associations with objects more or less common, no doubt proved a source of weakness to all. From the elements of these organizations it should now be possible to form, as Mr. Gregg suggests, a new one which would secure a large membership and be efficient in promoting the interests of architecture and of architects both young and old in the city of Toronto.

THE appropriation of \$60,000 passed by the Legislature of British Columbia for the erection of new Government buildings at Victoria, is meeting with vigorous opposition from the residents on the mainland. The Governor-General-in-Council has been memorialized to disallow the act of the Legislature. The area of the mainland portion of British Columbia is 366,300 square miles and the population 61,406, as compared with an area of 16,002 square miles and a population of 36,767 on the island of Vancouver. This is given as a reason why the proposed expenditure on new Parliament buildings should rather be applied to public improvements on the mainland. Another argument in support of this contention is that the people of the mainland contribute over two-thirds of the provincial revenue. It is further urged that the estimated yearly expenditure of the province will exceed the total revenue by about \$200,000, and that therefore the revenue cannot sustain the charge which the proposed expenditure would entail. There is likewise the contention that the capital of the province should be removed to the mainland on account of the majority of the population being resident there, and because of the inconvenience and expense imposed upon those who have to transact business with the Government at Victoria. The residents of the mainland recognize in the proposal to erect new buildings at Victoria a determination to fix the seat of Government there, hence the opposition which is being manifested. It is by no means likely that the authorities at Ottawa will disallow the act of the provincial legislature, therefore the only way in which the erection of the proposed new buildings is likely to be prevented is by the defeat of the existing government at the polls. Meanwhile preparations are actively going forward for the commencement of building operations.

THE London *Lancet* of the 8th of April contains the result of a very thorough enquiry concerning the water supply and general sanitary condition of the city of Chicago. This enquiry, the *Lancet* states, was undertaken by members of its staff for the benefit of Europeans who may visit the World's Fair. As proportionately a larger number of Canadians than Europeans are likely to visit Chicago during the next six months, the result of this enquiry may very properly be stated for their benefit. The Chicago river is declared to be in a "disgusting condition," especially in the vicinity of the stockyards, not far from the Southern Branch Pumping Station, where the filthy conditions are said to be such as to defy description. This condition is induced by animal refuse, indiscriminately mixed with sewage, being dumped into the river, in consequence of which the air of the locality is alleged to be charged with nauseating odors which cannot but be highly injurious to health. The domestic supply of water, which is drawn from Lake Michigan, is found to be in respect of color, total solid matter, hardness, chlorine and oxygen required to oxidize organic matter, superior to the choicest of London's supply. It contains, however, low forms of vegetable life and matter in suspension. The probability of these finding their way through the mains is such that visitors are counselled to use nothing but boiled or filtered water. Another source of danger is shown to exist in the custom of using ice in drinking water. A sample of water which had passed through a filter, upon being analyzed was found to contain low forms of vegetable life due to the melting therein of impure ice subsequent to filtration. Thus by the use of ice the good effects of filtration are nullified. In the light of the result of the above enquiry Canadian visitors to Chicago should keep as far as possible away from the neighborhood of the Chicago river, should insist upon the water they drink being boiled or filtered, and should avoid the use of ice.

THE safe resistance of floors in public buildings and other places where dense crowds are likely to congregate is a question of vital importance. From recent experiments it would appear that architects do not work on safe calculations regarding this matter. It is generally understood that a crowd of people when densely packed together cannot impose more weight than ninety pounds per square foot. The tests referred to, however, show that the dead load should far exceed that amount. Mr. C. H. C. Wright, lecturer in architecture at the School of Science, Toronto, in some experiments last March with thirty-two of his students, found that when they were placed close together in an area of 33.46 square feet, there was a load of 139 lbs. to the square foot. Their aggregate weight was 4,656 lbs., which shows the average weight to be 145.5 lbs. Mr. Bindon B. Stoney, the distinguished authority on bridges and roofs, has also conducted two experiments along this line. He packed a crowd of fifty-six laborers on the deck house of a ship, giving a total weight of 8,404 lbs., or an average of 145 lbs. As the area covered was 57 square feet, each man had a little less than one square foot of standing room, and gave a load of 147.4 lbs. per square foot. On another occasion he collected 73 laborers on the floor of a hut having an area of 77 square feet. Their aggregate weight was 10,948 lbs., an average weight of 150 lbs. to each. The result gave 142 lbs. to each square foot, and there was a possibility that two or three more men could have been squeezed in. Professor Kernot, of Victoria, tried a similar test with his class of engineering students. He packed 16 of them weighing 2,455 lbs., within an area of 18 square feet, which shan average of 153.4 lbs. to each man. The weight per

area was therefore 134.7, and there still remained unoccupied space. From these figures it would appear that the resistance of floors which are likely to carry heavy weights should not be less than three hundred pounds to the square foot, for as the average dead weight comes close upon 150 lbs. per square foot, double that strain should be allowed as a provision against sudden movements in a crowd, as in the case of a panic.

THE condition of the sanitary arrangements in the buildings of our towns and cities is of the utmost importance at the present time in view of the threatened cholera epidemic. It is therefore pleasing to note that Montreal and Hamilton are taking special steps to have such appliances in their respective cities as complete and sound as possible. This example should be followed by sanitary authorities in other places. It is most essential that plumbing work should be perfectly executed, as the least defect reveals itself by its unpleasant and unhealthy consequences. One of the chief requirements which very often does not receive sufficient attention, is the ventilation of the work in order to prevent any foul air being water-bound. There should always be a free escape provided for the air displaced by flushing, which otherwise would bubble up through the water by which it is supposed to be hermetically confined. Every soil pipe should have a ventilating pipe from the top carried above the eaves to the roof of the building, by which means all foul vapours escape to the open air. In places where the electric cars are in operation, there is another strong reason why a general inspection of plumbing work should be made; this is the discovery of electrolysis to metals caused by earth currents of electricity. In Hamilton, for instance, seven service pipes in the vicinity of the street railway power house were found to have been eaten out from this cause. The chemical decomposition to metals from electricity in the way mentioned is a serious matter, and one which should have the attention of everyone interested in the sanitary welfare of towns and cities.

WHILE minor matters are engaging the attention of the mayor and aldermen of the city of Toronto, the all-important subject of a pure water supply and an improved method of sewage disposal, are apparently receiving but scant consideration. There seems to exist no determination in the mind of the Council to grapple with the problem and stay with it until its proper solution shall have been discovered and carried out. Theories, reasonable and unreasonable, are from time to time advanced, but nothing is done. We are told that the effort to conduct the pure water of the lake through the sewage laden waters of the bay to the pumping station and thence through the city mains to the homes of the citizens, is contrary to common sense and will never succeed. This may in a measure be true. We would like to point out, however, that the chance of obtaining a pure supply of water by the present means would be vastly increased if an intercepting sewer were constructed which would carry the city sewage along the esplanade to a point where it could be safely discharged into the lake. After the bay had thus ceased to be the receptacle for filth from the city sewers, it might be cleansed of the deposits which at present it contains, and the water rendered comparatively pure by continual contact with the water of the lake, for the bringing in of which means could easily be devised. Such a method of procedure would be going to the root of the difficulty instead of trying to find means to mitigate its effects, while the cause is allowed to remain undisturbed. It may be a very good thing to know that by the application of chemicals the germ-laden deposits of sewage in the slips at which the pleasure boats of Toronto embark and disembark their passengers can be rendered less dangerous, but it would be much more satisfactory to know that the deposits did not exist. Toronto certainly is in need of public parks, to the securing of which the attention of the Mayor has lately been directed, but infinitely greater is the need of a pure water supply and a trunk sewer for the proper disposal of the sewage of the city, both of which we commend to his prompt and most serious attention.

THE second session of the Toronto Technical School has recently closed. It is a pleasure to learn that the results of the two sessions have greatly exceeded the anticipations of the promoters of the movement. During the session which has just closed the students numbered about three hundred. The attendance of this large number of students is said to have been regular and their progress most satisfactory. In view of the eagerness which has been displayed in taking advantage of the facilities offered for the acquirement of instruction in the various departments of knowledge required by artizans, we may look forward with confidence to the continued growth and increased usefulness of this new department of education. Indeed we shall not be surprised to see at no distant day technical instruction and manual training made a part of our system of public instruction. Such a movement has already taken place in some American cities, notably St. Paul, Minn., where there are in operation what are known as manual training high schools. The value of these schools is regarded as such that when recently the proposal was made to abolish them on the ground of expense, the Chamber of Commerce in a report on the subject said: "Destroy all the schools if you must, but leave us the manual training high schools." The fact is apparent that

our educational system does not as it should attempt to instruct the pupil in those subjects which are likely to be of most advantage to him in his future life. Notwithstanding that one pupil is foreordained by circumstances to earn his living by means of his hands and another by means of his head, our public school system assigns to each exactly the same studies. This is manifestly wrong, and the effect may be seen in the dislike which many youths manifest to forms of employment in which skilled hand labor is required. It may likewise be observed in the overcrowded ranks of the professions and what are known as genteel employments. What is needed to ensure a higher average of comfort among all classes and a higher condition of prosperity for the country is an increase of properly trained agricultural and artizan producers.

DURING the last five years architects, reputable builders and supply merchants have alike suffered from the doings of irresponsible and incompetent contractors. How to get rid of this undesirable class is problem to some extent an unsolved, although the quiet condition of the building market during the past year has been the means of breaking up many so-called "firms" whose members have returned to the ranks of journeymen, which they should never have left, or have sought pastures new in other lands. Some of the labor unions, especially the bricklayers, have also to a certain extent prevented by their by-laws a continuance of a competition farce. As far as the merchants are concerned, they are to a large extent responsible for their own loss; so long as they are willing to supply such customers with materials, so long may it be expected that they will continue to build at other people's expense. We are pleased to observe that merchants are learning by sad experience that this class of trade is better left alone. The trade in Chicago have originated a plan which to a large extent will eliminate these difficulties, and which is worthy of the consideration of Canadian contractors and supply firms. A mercantile agency has been incorporated by which reliable members, contractors and merchants, are protected. This agency keeps a perfect record of the financial responsibility of every building contractor in Chicago, compiled from opinions received from every person who has had business transactions with him. Stockholders alone are allowed to use this information, and they must be manufacturers of builders' supplies, approved of by a board of directors comprised of seven men appointed from the different interested industries. The collection department is a special feature of the concern. Parties temporarily embarrassed have every opportunity afforded them to make favorable settlement, while legal means are used to make those pay who are able but will not. There is also a system of arbitration in connection with the agency for the adjustment of disputed accounts. Should this scheme work out in practice as well as it looks in theory, contractors and material merchants in Canada would do well to take some steps along this line not only to improve their present condition but to prevent the disreputable contractors forced out of Chicago by the means described from coming into Canada.

IN another column we refer to the proposed act to protect the rights of wage earners as introduced by Sir Oliver Mowat in the Ontario Legislature. We also give a report of the visit of the deputation from the Builders' Exchange of Toronto to the Government asking for amendments to the bill. Should this bill become law without some modification, a great obstacle will be placed in the way of the building trade of Ontario. The object of the act itself is good, for journeymen have occasionally suffered from loss of their wages through dishonest and speculative builders, but if the third section of the act be passed as it now stands, the proposed remedy would be the means of crippling the operations of contractors to a large extent. It is also a question whether the section would reach those for whom it is intended. Taking the contractors as a body, we cannot help thinking there is only a small minority who would willingly keep any of their journeymen from what is justly due to them for wages. Therefore it is not reasonable to place such severe obligations upon the whole body of contractors with a view of overcoming the possible wrong-doing of the few. The President of the Toronto Builders' Exchange stated, when before the Government, that during the existence of that institution he had not heard of any of its members being guilty of such unjust action. As the membership of the Exchange contains most of the building contractors of any note in the city this statement should be regarded as a strong argument against unnecessary restrictions. The other clauses in the act do not propose any radical change in the existing Lien Act, but one cannot understand why a contractor should be required to produce his receipted pay list, as well as make a declaration stating that all wages have been paid to date, when applying for a progress certificate, while a mortgagor who is often himself the builder need only make the declaration referred to, when asking the mortgagee for an advance. It would appear from this, that the veracity of the contractor, working under ordinary progress certificates, is not considered by the promoters of the bill to be as reliable as that of builders who find it necessary to mortage their land before commencing to build. We think also that sub-contractors should come under all the provisions of the bill, for if the principal contractor is held respon-

sible for all payments to the journeymen on a building, he should have some protection against any contractors to whom it is necessary to sub-let part of the work. The members of the Government, who heard the delegation, promised that the objections raised by the delegation to the measure in its present form would have their best consideration, and from the remarks that fell from them during the interview there is reason to believe that the bill will be modified in the direction of their wishes.

ILLUSTRATIONS.

CARVED STONE MANTEL IN THE RESIDENCE OF MRS. CAMERON, CARLTON STREET, TORONTO—DARLING, SPROATT & PEARSON, ARCHITECTS—EXECUTED BY HOLBROOK & MOLLINGTON.

PRIZE COMPETITION DESIGN FOR A \$2,000 BRICK HOUSE—FROM "THE BRICKBUILDER."

ST. BARNABAS CHURCH, ST. CATHARINES, ONT.—C. J. GIBSON, ARCHITECT, TORONTO.

ACCEPTED COMPETITIVE DESIGN FOR PROPOSED NEW GOVERNMENT BUILDINGS AT VICTORIA, B. C.—F. M. RATTEBURY, ARCHITECT.

The time of the architect being taken up with the preparation of the working drawings, he was not able to do more than send for publication a rough tracing of the perspective drawing of his



ST. BARNABAS CHURCH, ST. CATHARINES, ONT.—C. J. GIBSON, ARCHITECT, TORONTO.

design and of the block plan, showing the grouping. A description of the design, as published in the Victoria Colonist, appeared in the CANADIAN ARCHITECT AND BUILDER for April. The site is an extremely beautiful one, well laid out with trees and grass and with James Bay in the foreground divided only from the grounds by a road.

ONTARIO ASSOCIATION OF ARCHITECTS.

A MEETING of the Council was held on May 2nd to consider the report of the Board of Examiners upon the recent examinations of the Association. The following are the returns:

FINAL EXAMINATION.

Passed—S. G. Beckett, Wm. Fingland. Conditioned—T. A. Harvey, Wm. Rae.

SECOND INTERMEDIATE EXAMINATION.

Passed—W. F. Howland, W. A. D. Graham, W. P. Over. Conditioned—C. J. Read.

FIRST INTERMEDIATE EXAMINATION.

Passed—A. Baker, J. P. MacLaren. Conditioned—F. W. Langley.

Candidates who are conditioned will be allowed to take a supplemental examination in the subjects in which they have failed. This examination will be held in the autumn. When the date is fixed notice of it will be sent to each candidate entitled to come up for the examination.

CUT VERSUS WIRE NAILS.

There are over three hundred varieties of nails in existence, deriving their names chiefly from the shape of their heads and points, or according to the purpose for which they are generally used. Two of the classes in most common use are those known as cut nails and wire nails. The former are cut by machinery out of sheets of iron and have their angles sharp but rough; the latter are known also as French nails (*a pointes de Paris*) are round, very tough, and are supposed to possess the good quality of not splitting the wood when properly used. In some recent experiments in the United States to ascertain the relative holding powers of these two classes of nails some interesting facts were developed. In the 58 series of tests, comprising ten pairs of cut and wire nails, of one size and weight, driven into spruce wood, 1160 nails were used, varying in length from $1\frac{1}{8}$ to 6 inches, and in each case the cut nails showed superior holding power. An analysis of the several tests is as follows:

In spruce wood in 9 series of tests, comprising 9 sizes of common nails (longest 6 inches, shortest $1\frac{1}{8}$ in.) the cut nails showed an average superiority of 47.51 per cent.

In spruce wood in 6 series of tests, comprising six sizes of light common nails (longest 6 inches, shortest $1\frac{1}{8}$ in.) the cut nails showed an average superiority of 47.40 per cent.

In spruce wood, in 16 series of tests, comprising 15 sizes of finishing nails (longest 4 inches, shortest $1\frac{1}{8}$ in.) the cut nails showed an average superiority of 72.22 per cent.

VALUE OF ADVERTISEMENTS.

We have no patience with those mistaken minded members of the architectural profession who look at the advertising pages of their periodicals as useless, burdensome material, to be torn off without a second thought and consigned to the waste basket. These men are always behind the times, opinionated to the last degree, and lacking that knowledge of improvements in building materials and appliances which they owe to their clients. They do not realize that through the advertising columns of the professional journals there is set forth the record up to date of the inventions and discoveries that are enabling us to build better, more quickly, more cheaply. The manufacturer, introducing a new form of building material, or some patented appliance, seeks to reach the architects through what seems to him the most natural, the most legitimate channels,—the advertising columns of the architectural press.—*The Brickbuilder.*

VOL. VI.]

The Canadian Architect and Builder.

[No. 5.

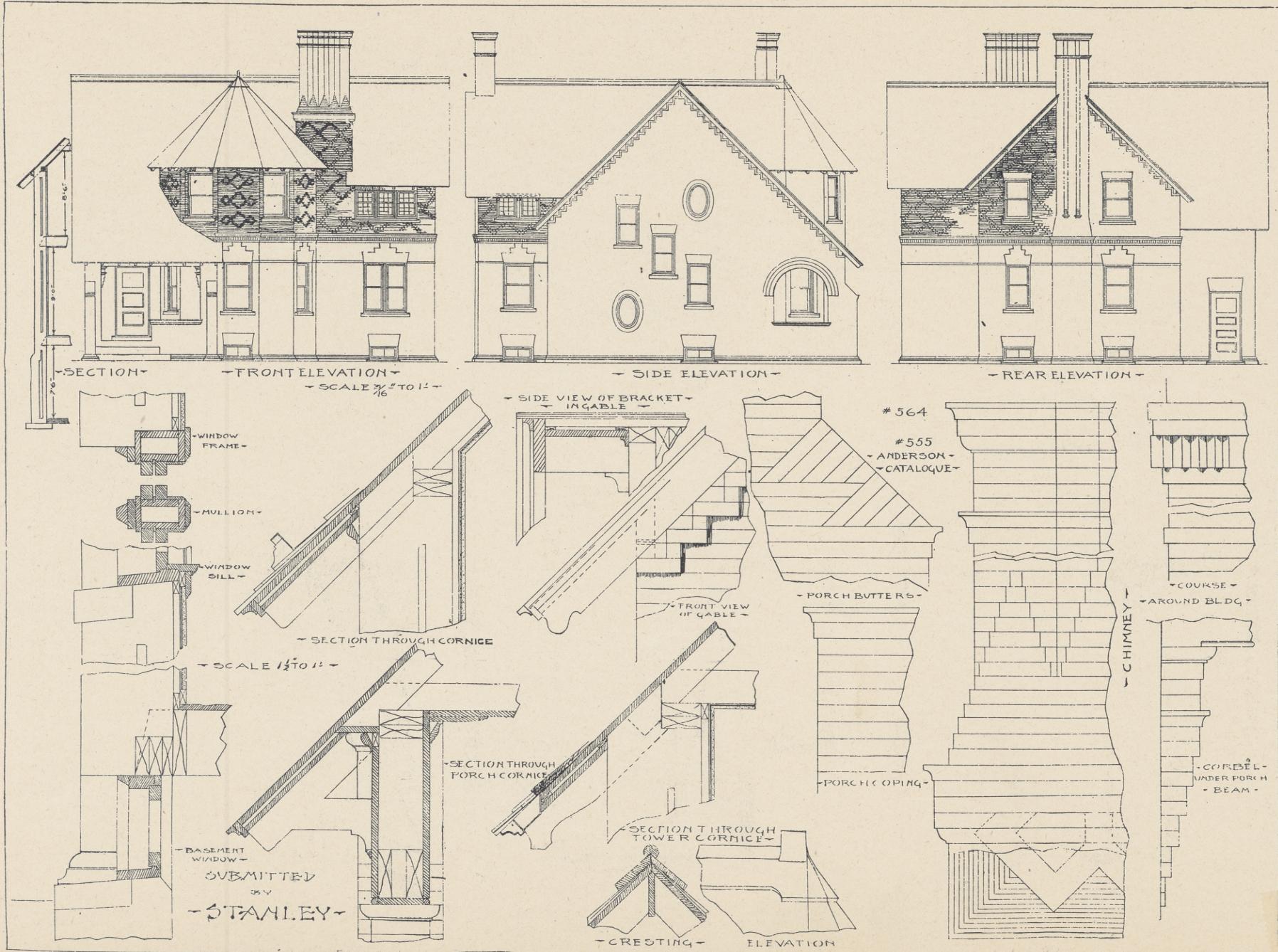


CARVED STONE MANTEL IN THE RESIDENCE OF MRS. CAMERON, CARLTON STREET, TORONTO.

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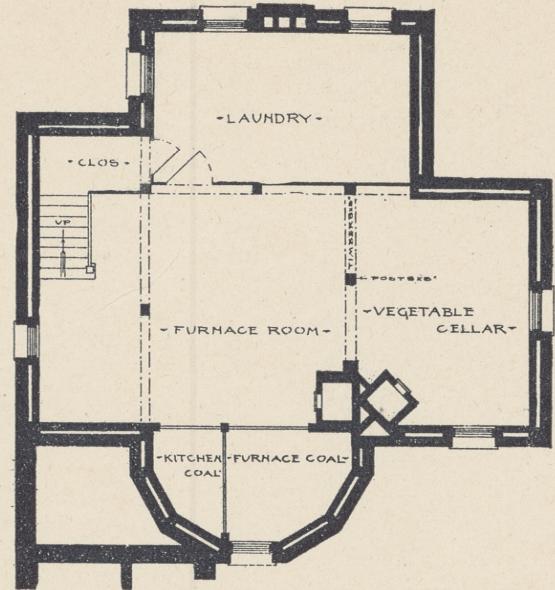
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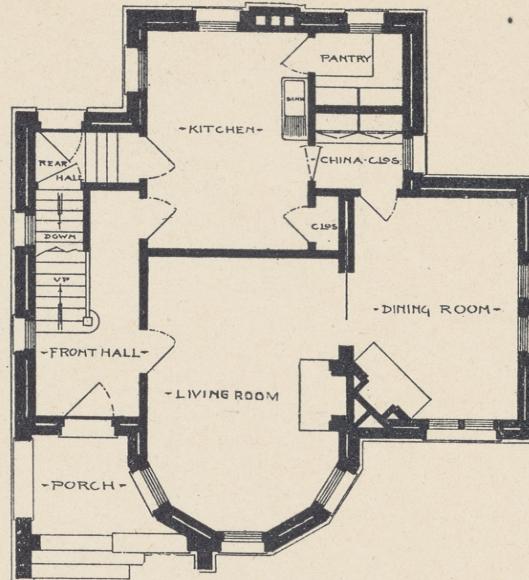
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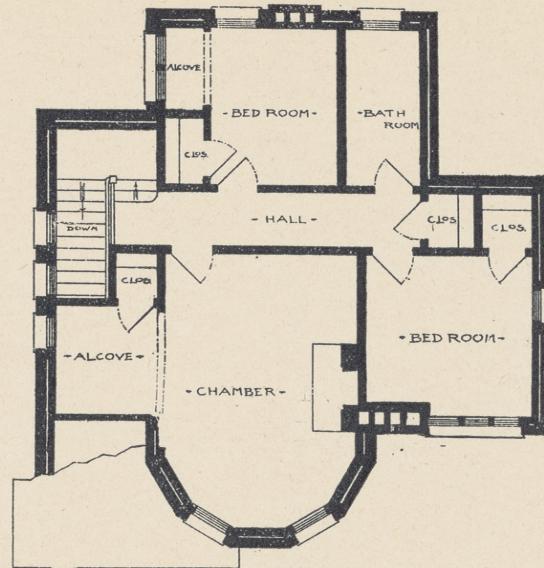
By S. STANLEY, Milwaukee, Wis.



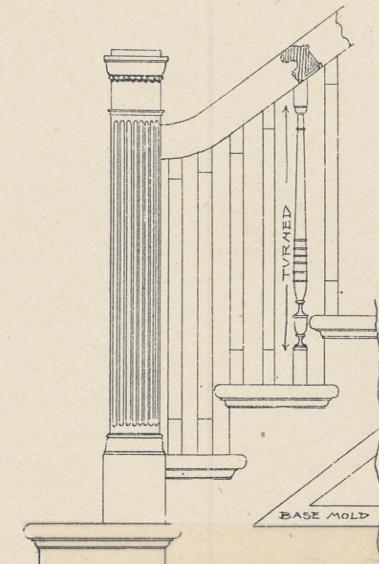
-BASEMENT PLAN-



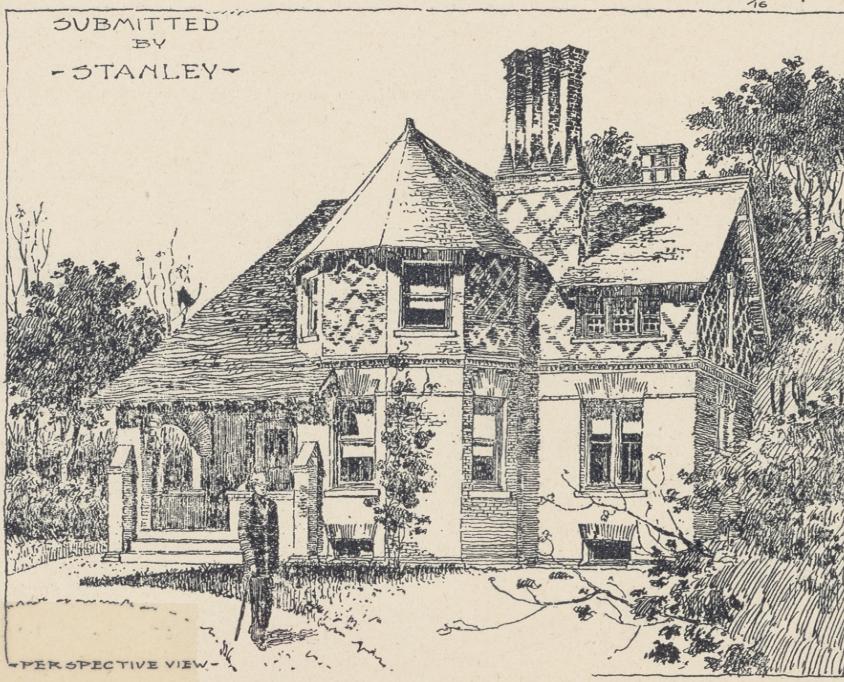
-FIRST FLOOR PLAN-



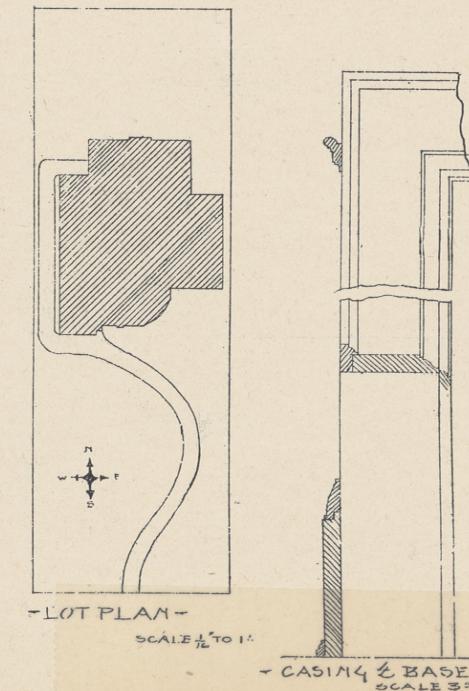
-SECOND FLOOR PLAN-



The Brickbuilder.



PRIZE COMPETITION DESIGN FOR A \$2,000 BRICK HOME.



CORRESPONDENCE.

[Letters are invited for this department on subjects related to the building interests. To secure insertion, all communications must be accompanied by the name and address of the author, not necessarily for publication. The publisher will not assume responsibility for the opinions of correspondents.]

COPYRIGHT OF PLANS.

May 5th, 1893.

Editor CANADIAN ARCHITECT AND BUILDER.

SIR : Re the complaint of piracy practised by parties claiming to be architects, in the April number of the CANADIAN ARCHITECT AND BUILDER, permit me to say that in the United States a copyright can be obtained for a design, map, drawing, etc. This, however, must be done before publication of the article. Two complete copies of the work must be sent prepaid, or under the free labels furnished by the librarian, to perfect the copyright. Without the copies above required, the copyright is void, and a penalty is incurred. No copyright is valid unless notice is given by inserting in each copy, "Entered according to Act of Congress, in the year —— by —— in the office of the Librarian of Congress at Washington."

The copyright secures the exclusive right of publishing the article copyrighted for the term of 28 years. Is not this the practice in Canada? Then why can't those who feel injured by the piracy of so-called architects, as you call them, get redress?

Respectfully,

VOX POPULI.

A CONTRADICTION.

OTTAWA, April 24th, 1893.

Editor CANADIAN ARCHITECT AND BUILDER.

DEAR SIR : In your April number we find a paragraph stating that Mr. Forsyth, of Montreal, has entered suit against us "to recover royalty on granolithic pavement," and that he "asks for an injunction on the execution of our contracts."

These statements are absolutely untrue. Mr. Forsyth has not entered an action against this Company for the above or any other cause.

Yours truly,

CANADIAN GRANITE CO. (LTD.),

Per A. MacLean, Pres.

[The paragraph in question was based upon uncontradicted statements which appeared in the daily press, and was published in good faith. In view of the above contradiction, however, we desire to express our regret that it should have appeared in this journal.]

COMPETITIONS.

Competitive designs for a new City Hall for the City of New York are invited by the City Board of Commissioners until the first of September. Printed instructions regarding this competition may be obtained on application to the Comptroller, 280 Broadway, New York city.

The competition for designs for a memorial monument to the late Sir John A. Macdonald, to be erected in Toronto, has been decided in favor of Mr. Hamilton McCarthy, of Toronto, Mr. P. Heber and Mr. J. Dunbar, respectively. The statue will cost \$10,000.

PERSONAL.

The death is announced at Adolphustown, Ont., on April 19th, of Mr. Thos. Gibbs, one of the oldest provincial land surveyors of Ontario.

Mr. S. G. Curry, ex-president of the A. O. A., has of late been temporarily residing at Port Hope, Ont., where he has several commissions to execute.

Mr. T. A. Morrison, of Montreal, lately spent a couple of weeks in Toronto and the west, in behalf of the business interests with which he is identified.

Mr. J. R. Rhind, and Mr. Edward Maxwell, architects, Montreal, have removed their offices to the new Board of Trade Building. Mr. H. Austin Jones, architect, of the same city has removed to No. 204 St. James street. Messrs. Cox & Amos, architects, have removed to Temple Building.

Mr. J. C. A. Heriot has entered the office of Mr. A. F. Dunlop, R. C. A. architect, Montreal, as junior partner. Mr. Heriot was a former pupil of Mr. Dunlop, and after passing successfully through a course of architecture at Cornell University entered the office of Mr. Perry, the supervising architect of the New York State Capital, at Albany, N. Y., where he remained for two years, leaving there to further his studies in New York City, where he held positions for two years in the offices of Robt. H. Robertson and Bremner & Tryon. Mr. Robertson, associated with Mr. Potter, was one of the firms selected for the final competition for the Cathedral of St. John the Divine. Mr. Pope will also lend his valuable services to the firm as assistant superintending architect, being thoroughly qualified for this branch of the work.

A pleasing event took place on the 10th inst. at the monthly business meeting of the Stonecutters' Section of the Toronto Builders' Exchange when their late treasurer, Mr. George Walker, was presented with a handsome gold-headed snake wood cane with his name engraved upon it, as a token of the high esteem in which he was held by his fellow members and as an expression of their good wishes on his entering into private life. Mr. John Vick, president of the Section, made the presentation in an eloquent and suitable manner, to which the recipient replied in appropriate terms. Mr. Walker has been connected with the Stonecutters' Association since its establishment about 15 years ago, holding the office of treasurer, which he resigns on retiring from an active and successful business career. Mr. John Barnard, his late partner, succeeds him in the office of treasurer to the association.

QUESTIONS AND ANSWERS.

[Readers are invited to ask through this department for any information which they may require on lines consistent with the objects of the paper. Every effort will be made to furnish satisfactory answers to all such inquiries. Readers are requested to supply information which would assist us in our replies. The names and addresses of correspondents must accompany their communications, but not necessarily for publication.]

"BUILDER" writes : How can you find the pitch of a roof by multiplication?

Ans.—If $\frac{1}{2}$ pitch is required multiply span by 71 ; if $\frac{1}{4}$ pitch by 556 ; if $\frac{1}{3}$ pitch, by 6 ; if $\frac{3}{8}$ pitch, by 625, and if $\frac{5}{8}$ pitch, by 8.

T. N: How many nails are required for 1000 laths, and how many yards of plastering will cover this number?

Ans.—Eleven pounds of lath nails and 70 yards of plastering may be estimated.

ART MAXIMS.

THE following verses, kindly sent to us by a correspondent, are from the poems of William Watson, who wrote the best ode on the death of Tennyson, and it was thought might succeed him :

Often ornateness
Goes with greatness ;
Oftener felicity
Comes of simplicity.

Talent that's cheapest
Affects singularity ;
Thoughts that dive deepest
Rise radiant in clarity.

Life is rough ;
Sing smoothly, O Bard !
Enough, enough,
To have found life hard.

No record Art keeps
Of her travail and throes.
There is toil on the steeps,—
On the summits, repose.

LEGAL DECISIONS.

At the Hamilton assizes a labourer brought an action for \$1,500 damages against Mr. Joseph Kent, contractor, of that city, under the Workmen's Compensation Act. It appears that the plaintiff was employed in building a sewer in November last, and while removing some boards the side of the trench caved in and the plaintiff was seriously hurt. It was claimed by him that the trench was improperly shored up. The defendant, however, gained a verdict in his favor.

In Cook v. Belshaw the question is raised whether a mortgage, registered before a lien but not made until after the attaching of the lien, can be considered a prior mortgage of such a nature that the lien-holder could avail himself of the benefit of the provisions of the Lien Acts, giving him priority for the amount to which the selling value of the land was increased by the lien-holder's work or materials. The Master-in-Orginary held it was a prior mortgage in this sense, but his decision has been appealed against.

Caldwell v. Mills was an action under the Workmen's Compensation Act brought by J. Caldwell against Geo. E. Mills, contractor, of Hamilton, for \$2,000 damages for injuries. The plaintiff, it appears, was carrying scaffolding across a plank when the plank broke and he fell into a cellar, breaking three of his ribs. It was alleged the plank was rotten, but the defence was that the plank broke by another workman throwing a heavy piece of scantling on it when the plaintiff was crossing. Verdict for the plaintiff, \$75 ; the question of costs being reserved.

JONES v. TORONTO SCHOOL BOARD.—The plaintiff carried out certain works for the defendants under a contract which contained the usual clause to the effect that no extras would be allowed unless the work was executed under the written authority of the architect. Certain extra work was carried out without such authority, but the architect allowed a certain sum for same, and when the job was completed the plaintiff accepted in full of all claims a cheque setting out the amount of contract, the claim for extras and the amount allowed for such by the architect. After the lapse of two years the plaintiff brought the present suit claiming the balance of the extras as charged by him. The case was heard by Chief Justice Armour, who dismissed the action without calling upon defendants, because plaintiff could not produce any written authority for the extra work as called for by the terms of his contract.

EVANS v. COWAN (two cases.)—In this case the plaintiff invited tenders separately for the stone foundation, brickwork and carpentry to a large building to be erected in Montreal for a skating rink. The defendant's price for the brickwork was accepted, and a contract was entered into upon the usual terms. When the foundation work was finished, the brickwork to the walls was started by Cowan, but after constructing a part serious defects showed themselves in the work which the defendant alleged was due to the bad construction of the foundation. Evans ordered the work to be pulled down which Cowan did, but refused to rebuild. After protests and counter protests between the parties Cowan took action in the Supreme Court, asking to have his contract declared at an end, that the plaintiff be condemned to pay him \$1,000 damages, and allow him to remove all his building materials. About the same time Evans entered a suit against Cowan for \$3,850 damages for non-completion of his contract. The two actions were heard together before Mr. Justice Matthew, who gave judgment in favor of Cowan in both cases, on the grounds that the evidence showed the foundation to be defective, and, as Evans provided that work, Cowan was not obliged to accept and build upon it. Appeals were taken against both judgments and the higher Court decided in favor of Evans in both suits, holding that there was no clear evidence that defects existed in the foundations for which Evans was responsible.

A committee has been formed in Toronto, with Mr. A. M. Cosby, 66 King E. as secretary, to raise \$2,000 by subscriptions for enlarging the dials of the clock in the tower of St. James Cathedral to a diameter of 15 feet, and lighting same by electricity.

THE PROPOSED AMENDMENT TO THE LIEN LAW.

SIR Oliver Mowat has introduced in the Ontario Legislature, a bill entitled "An Act to further Facilitate the Enforcement of the Just Rights of Wage-earners and Sub-contractors." Its principal clauses read as follows:

1. Every device by any owner or contractor which shall be adopted in order to defeat the priority of wage-earners for their wages under the several Acts relating to mechanics' liens shall, as respects such wage-earners, be null and void.

2. In case an owner chooses to make payments to the mechanics, labourers, or other persons referred to in the 4th section of the revised *Mechanics' Lien Act*, for or on account of just debts due to them for work done or materials or machinery placed or furnished as therein mentioned, without the proceedings mentioned in sections 11 to 14 of the said Act, and shall within three days afterwards give by letter or otherwise, written notice of such payment to the contractor or his agent, such payment shall, as between the owner and the contractor, be deemed to be a payment to the contractor on the contract generally, but not so as to affect the percentage to be retained by the owner as provided by the sections 7, 8 and 9 of the said *Mechanics' Lien Act* as amended by the Act passed in the 53rd year of Her Majesty's reign, intituled *An Act to amend The Mechanics' Lien Act*.

3—(1) Before a contractor shall be entitled to receive a payment on his contract, it shall be his duty to produce to and leave with the owner, his pay list or a duplicate of his pay list, containing the receipts of the persons mentioned for the wages due to them up to and including the day before the intended payment, and an affidavit or statutory declaration by the contractor, (or in his absence by his agent competent from personal knowledge to speak to the facts), verifying such pay list and receipts, and stating that the said pay list names all persons employed on the work, and that all persons who up to that time have been employed on the work and entitled to wages, have been paid in full; and an affidavit or a statutory declaration to the same effect by the architect or superintendent of the work (if any), unless he has made the like affidavit or statutory declaration under the provision aforesaid as to an agent. The said affidavits or statutory declarations may be to the effect set forth in the schedule to this Act, and marked A.

(2) The said pay list so received and the said affidavits shall be conclusive evidence in favour of the owner making the payment unless at or before making the payment he had actual and express notice of any fraud on the part of the contractor in obtaining the signatures and receipts of the persons named in the pay list or others.

(3) Any payment made on the contract without having received such received pay list and affidavits, or with actual and express notice of unpaid wages, shall not be a valid payment as against persons whose wages are unpaid at the time of the payment on the contract.

4. The lien of wage-earners for thirty days' wages, or for a balance equal to thirty days' wages, provided for by section 9 of the *Mechanics' Lien Act*, as amended by section 2 of the said Act intituled *An act to amend the Mechanics' Lien Act*, shall not be defeated or impaired by any attachment issued subsequently to the contract, or by any garnishment subsequently had, or by any execution subsequently issued, or by reason of the work contracted for being unfinished, or of the price for that or any other reason not being payable to the contractor.

5. In case of the contract not having been completely fulfilled when the lien is claimed by wage-earners, the percentage aforesaid shall be calculated on the work done or materials furnished by the contractor.

6. Where a mortgage is given to secure an intended loan of money which is to be made thereafter according or with reference to the progress of work done, or materials or machinery placed or furnished as aforesaid, on the land mortgaged, no advance thereafter made by the mortgagor shall have priority over the claims of mechanics, labourers, or other persons referred to in section 4. of *The Mechanics' Lien Act* as aforesaid if the mortgagee at or before the time of such advance has actual and express notice that there are any such claims as aforesaid unpaid; nor unless at the time of the advance he shall require and receive from the mortgagor an affidavit or statutory declaration stating that all such persons as aforesaid have been paid in full up to the time of the advance; and an affidavit or statutory declaration by the architect or superintendent of the work (if any), speaking to the best of his knowledge and belief to the same effect. The said affidavits or statutory declarations may be to the effect set forth in the schedule to this Act, marked "B."

7. In case of the sale or mortgage of an unfinished house or building, with or without the land on which the same stands, if its being an unfinished house or building is such as to be apparent to an ordinary observer, the purchaser, before paying his purchase money, or giving a mortgage or other value or security for any balance of such purchase money, or the mortgagee before advancing any money on the security of a mortgage or otherwise, shall require from the vendor (in the case of a sale) or from the mortgagor (in the case of a mortgage) similar affidavits or statutory declarations of the payment of all claims as are provided for in section 6 of this Act; and the purchaser or mortgagee shall not be entitled to priority in respect of such claims, if at or before the time aforesaid he had actual and express notice that there were such claims as aforesaid unpaid; nor unless he shall have received such affidavits and statutory declarations aforesaid.

8. Where in the case of a prior mortgage or other charge, the selling value of the land is increased by the construction, alteration, or repairs of the building, or by the erection or placing of the materials or machinery on the said land, the said prior mortgage or other charge shall retain its priority to the extent of the value or amount for which such prior mortgage or other charge is a security before such construction, alterations or repairs of such building, or before the placing of such materials or machinery on the said land; and the lien given by the said Acts shall be entitled to rank upon the increased value given to such land by the said improvements in priority to such mortgage or other charge (see R. S. O. c. 126, s. 5, sub-sec. 3, and *Kennedy v. Haddon*, 19 Ont., R. 240; *Richards v. Chamberlain*, 35 Grant 402, and *West v. Sinclair*, 28 Canada Law Jour. 119.)

9. Where any proceeding is taken to enforce a lien under the *Mechanics' Lien Acts*, in case a mortgagee of the land is served with a written notice of such proceeding being had, he shall thereafter be entitled to attend the proceedings: and in such case he shall not, without the leave hereafter mentioned, take any proceeding for sale or foreclosure, nor proceed to exercise any power of sale until the proceedings to enforce the lien have terminated; but he may without leave serve any notices required to be served in order to the due exercise of the power. The leave aforesaid may be granted by the county judge, master or official referee, before whom the lien proceedings are pending, and shall only be granted by consent, or (if without consent) on a reasonable consideration of all the circumstances in view of what would be just to both parties.

Clause 10 to the end of the act deals with provisions for legal proceedings. They give the Division Court and City Magistrate jurisdiction in matters relating to the payment of wages, and

any order made by the latter can be made a judgment in the Division Court and enforced as such.

On the 8th inst. a deputation from the Toronto Builders' Exchange, consisting of Messrs. John Aldridge, David Williams, M. Murphy, William Park, Wm. Pears, George Moir, M. Vokes and James Tennant, with Messrs. G. Ritchie and Frank Denton as legal advisers, waited upon the Ontario Government with regard to the above act. The deputation was introduced by D. Gilmour, M.P.P., and received by Sir Oliver Mowat, Hon. A. S. Hardy, C. F. Fraser, John Dryden and G. W. Ross. Mr. Pears, President of the Exchange, in speaking on behalf of the delegation, said that the bill as it stood would adversely affect legitimate business to a greater degree than it would remedy an injustice supposed to exist affecting wage-earners. He referred to certain amendments which the association he represented desired to see made to the bill before it became law, and said as regards section 1 he thought it should read so as to apply to the same parties mentioned in section 4 of the "Mechanics' Lien Act" viz: every mechanic, machinist, builder, miner, labourer, contractor, or other persons doing work upon or furnishing materials to be used in the construction of a building. He considered the supply merchant had as much right to be protected from devices to defeat payment for materials as workmen for their wages. Section 2 he found no fault with, but section 3 he considered embodied the chief weak point of the bill. It was almost impracticable, and should be struck out as absolutely unnecessary, while section 6 remained. It did not even reach the parties it was intended to, and would greatly hamper the business of a legitimate builder. He believed that any workman who had lost wages could show that it was not because the contractor had received his money and had not paid off his workmen, but because the latter had not been able to get his money from the building owner, and the section would not reach this man. These were the cases where workmen lost their wages, or when the builder and owner were the same person. He could honestly say he had never heard of a man not being paid by a contractor when the contractor had received what was due to him. Section 4 was considered just, but section 5 should include the same parties suggested for section 1. He would also propose that the percentage retained on a contract should be applied to the liquidation of liens before being used for completing the building. The objects which it was hoped section 3 would attain he thought, as already suggested, would be amply provided for by section 6, and therefore this and the following section should stand while section 3 should be expunged. With regard to section 8, he considered an amendment should be added to the effect that the value of improvements referred to should be estimated at 50 per cent. of their actual cost; thus while 50 per cent. would go to the mortgagee, there would be also 50 per cent. of their value available to satisfy any existing liens upon the building. With regard to the jurisdiction of matters under the act, he thought that the Division Court should be the legal tribunal for liens, even those now provided for in the High Courts by the "Mechanics' Lien Act," and he asked that the Bill be allowed to cover this ground. In conclusion he wished it to be understood that the object of the delegation was not to prevent justice being done to the wage-earner, but that both classes should be placed on a fair and equal footing in their business connection.

Mr. John Aldridge also pointed out that section 3 which was aimed at speculative builders, would not touch that class to any extent, as such men were generally building owner and builder combined. If the clause was allowed to stand as at present it would only be the means of hampering the work of legitimate contractors. He doubted very much whether it would be possible to produce receipts for all wages paid, as they were not always obtainable.

Sir Oliver Mowat asked if this clause would meet the views of the delegation if it was altered so as simply to provide for the production of an affidavit when an advance was required declaring that all wages due say a fortnight previous to that date had been paid.

Mr. Aldridge in reply thought that the trade would be satisfied with any arrangement as long as they were not hampered in their business, but as the clause would not reach the parties intended he did not see the necessity of it being in the Act.

Mr. Ritchie strongly urged that in clause 5 it should be made quite clear that lien holders had to be satisfied before any of the percentage held by the building owner could be devoted to completing the building.

Sir Oliver Mowat thought the clause was clear on that point.

Mr. Ritchie also drew attention to the fact that no provision was made in cases where a builder purchased land simply on the terms of a building agreement. He therefore suggested a clause should be inserted to the following effect: "In case a purchaser of any land shall make default in carrying out the terms of an agreement for the purchase thereof, a lien shall not be defeated by such default, but shall be attached to the estate or interest of the person to whom the land shall revert by reason of such default." He also thought that claims under the lien laws for wages and materials should be transferred to the Division Court from the higher Courts, as he had often found in his experience that costs prevented the bringing of actions for small amounts.

Mr. Denton agreed that clause 6 in the Act accomplished all

that clause 3 attempted to, and therefore there was no necessity to binder legitimate business.

Mr. Aldridge received no answer to his question whether there was a law calling upon a workman to give a receipt for wages, and he again urged it would be impossible to obtain receipts in some cases.

In reply to Mr. Hardy, who stated that the journeymen complained of the loss of large amounts of wages, Mr. Vokes pointed out that these cases probably arose from men working under an agreement very common among small builders, which provided that the wages for the work be paid when the building was completed and sold. If it was not disposed of the workman did not get his wages, and he probably considered it was a hardship overlooking the fact that he undertook the work with a clear understanding of the risk. After some further remarks from Mr. Hardy the deputation withdrew, having received a promise that the questions raised should receive every consideration.

CONSTRUCTION OF HARDWOOD DOORS.

In constructing the modern hardwood door, a series of operations are gone through by the cabinetmaker which are extremely interesting and of value to those who desire to know something of the methods of construction employed in completing this now universal detail, writes Owen B. Maginnis to the *Building Monthly*. These operations embody a number of systems of proceeding, each aiding to a final end, and are as follows:

The first process is to glue the cores or grounds together. These generally consist of kiln dried white or yellow pine, say $1\frac{1}{2}$ inches thick for an $1\frac{1}{4}$ -inch veneered door, the veneers being $\frac{1}{8}$ inch thick. The cores are generally got out full enough to allow for facing and thicknessing on the jointer and in the planer. The number of pieces in the cores depends on the desired width of the stile or rail, as, for instance, a 6-inch would require a $\frac{3}{4}$ -inch band of the necessary hardwood, ash, oak or walnut, as specified, and four $1\frac{1}{4}$ -inch pieces of pine.

In glueing these cores together they are carefully jointed with the plane and scratched, then heated in the hot box and at once glued, being pressed tightly together with large hand screws, in order to squeeze out the superfluous glue and close the joints.

In making joints in veneered work the surface of the joint must in all cases be (a little shaving) hollow, for the purpose of allowing the outer arises to come close together. Of course, all the cores should be long enough to make the necessary height, as 7 feet 8 inches long for a 7 feet 4 inches door, and so on as needed, always allowing enough to round over the bottom ends, so that the veneer will not be torn off when moving the door. When the glue is set the surfaces are scraped off clean, and they are faced up perfectly out of wind of the jointer and afterwards tried up true with the try plane. This being done the stiles and rails, which are built up in the same manner, are brought to the planer or planing machine and there thicknessed. The stuff cores are then brought back to the bench, where they are surfaced as before with the try plane (to remove all lumps) and scratched with the scratch plane to form a keying for the veneer. All knot holes or flaws which might be liable to cause a defect in the veneer are carefully filled up to insure good veneering. This being done, it is usual to prepare the veneer after it has been ripped to its necessary width and crosscut to its length—that is, the different pieces for the stiles, rails, muntins, etc.

It is usually prepared by smoothing the poor side (being very careful that it is entirely free from spots or shakes, little knots or other flaws) and scratching it thoroughly to insure a firm keying for the glue. All the pieces (which generally run from $\frac{1}{8}$ thick up to $\frac{1}{2}$) are placed between strips edgeways in the hot box, and allowed to become thoroughly impregnated with the heat so as to keep the glue from cooling too quickly, besides opening the pores of the wood to admit it. While the veneers are in the box the cores are placed (the stiles first, in pairs) on the glueing horses and the big handscrews set ready for applying, keeping the jams wide enough apart to take in two pairs of 2-inch stiles, or eight inches, or six inches, for one pair of 3-inch, and so on as required. When the veneers are sufficiently heated the flat faces of the cores are glued both sides and turned up on their edges (hardwood strip side up) slightly apart, and the veneers are dropped between.

Be sure, however, to have the points of the grain up, to have the grain running up, and to have the grain so that they will pair alike. This should always be done before placing the veneers in the box. Having placed the cores of the stiles on the edges to which the hard wood strips is affixed the wood-worker takes his veneer and after carefully matching the grains places them grain points up with the scratched side towards the glued faces of the cores resting on the horses so that the edges of the veneers and cores will come fair. He will then place a veneer on each of the right and left outer faces of the cores. Having done this he places a cawl or piece of $1\frac{1}{4}$ -inch stuff on each outside to press the outer veneers against their ground, and takes the big hand screws which have been set to span the combined width of cores and veneers. He places one at either end about two inches from the end spaces, the rest eight or ten inches apart, applying each screw from opposite sides. He screws the inner throat screw till it grips on the edge, and then turns the outer lever screw solidly down on the cawls, thus pressing the surfaces tightly together and forcing the glue into

the scratches, at the same time driving out that which is superfluous. Before the screws are permanently screwed tight, the whole mass is turned up to see that the veneers completely cover the whole width of the surfaces and if they do not they must be driven to their places with a block, taking care not to bruise or break the edges. Be certain, too, that the screws are all tight and the veneers pressed to a perfectly close joint.

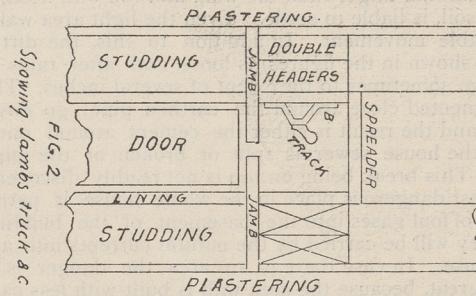
It is best for two to veneer, for one can regulate the veneers while the other is applying the screws, and both can act together on the screws afterward, giving more power. The glued stiles or mullions are then left in the screws about five hours to allow the glue to set.

Let me here impress the fact that the stuff must in all cases be thoroughly heated, and the glue perfect glue (about one-third water and two thirds glue) laid on quickly with a large soft brush from a large pot, also that the operation be rapidly done before the stuff has time to cool.

The crawl must be only the exact width of the stuff and no wider. It is advisable that the jaws of the hand screws be also wide enough to reach across the width.

SCARFED BEAMS.

Where neatness is more essential than strength, scarfed joints are preferred to any arrangement of "fishing," because a beam united by scarf and bolts is of the same breadth and depth at the joints as at other parts. In order that the bolts may not be screwed through the timber and to increase the clamping surface, it is advisable to add a plate of iron on the faces of the beam where the heads and nuts of the bolts pass through. The ends of these plates may be turned into the wood to give greater grip. But it is desirable to avoid depending solely upon bolts for the strength of a scarf, owing to the effect of the shrinking of the timber and the liability of the bolts to be, in consequence of their small dimensions, pressed into the wood. Keys or wedges can be often used to keep the upper and lower parts in their places. Varieties may be almost infinitely multiplied by increasing the number of the faces, whether oblique or square, and uniting the parts either by tabling, keying or a combination of the two; but in most cases, the greater simplicity should be aimed at, in order that the parts may the more readily be made to fit each other with accuracy. Very complicated scarfs have been used by some old carpenters, respecting which Robinson observes that "many seem to aim at making the beam stronger than if it were one piece," an absurdity too manifest to need refutation. When a scarfed beam is exposed to transverse strains, the joint should be varied from the ordinary form. When a piece of timber, subject to compression in the direction



of its length, has been scarfed, oblique faces should be avoided because of their tendency to slide upon each other.

Though bolts are commonly used to secure scarfed joints, iron hoops or straps, driven on tightly, have been recommended in their stead and possess the advantage of not weakening the timber. In joints that depend wholly on bolts, Tredgold recommends that the sum of their areas should never be less than two-tenths of the area of the section of the beam. He has also given the following rules for the length of scarfs: In oak, ash or elm, the whole length of the scarf should be six times the depth or thickness of the beam, where there are no bolts. In fir without bolts, twelve times the depth. The whole length of a scarf dependent wholly upon the bolts, should be for oak, ash or elm about three, and in fir, six times the depth of the beam. When bolts and indentures are used together, the length of the scarf may be in hard wood twice, and soft wood four times the depth.—*The Architect.*

New buildings to the value of nearly \$2,000,000 are said to be in course of construction at Winnipeg.

TESTS OF WHITE PINE.—Some tests of the transverse strength of small pieces of pine made by Mr. James W. Woodman, of the Minneapolis Building Inspector's force, and published below, indicate the wide variation existing in the strength of different samples of that wood. All but two pieces were from different boards, and as they were taken from the refuse of a large factory there is small chance that any two except those mentioned above were from the same tree. All were as carefully gauged and squared as possible with joiner's tools, and the loads were applied slowly. Thirteen pieces, one inch by one inch, twelve inches between bearings and loaded at center, broke as follows?

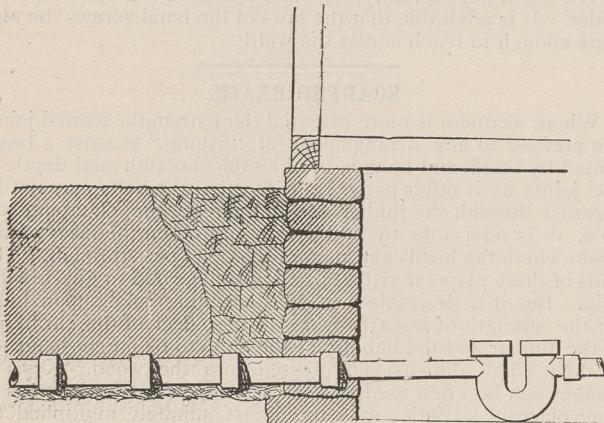
1,420 pounds	4,464 pounds	7,395 pounds	10,540 pounds
2,580 pounds	5,610 pounds	8,280 pounds	11,270 pounds
3,450 pounds	6,530 pounds	9,295 pounds	12,420 pounds

13,210 pounds
The average breaking strength being 420 pounds.

SANITATION IN BUILDING

EARTHEN PIPES AT FOUNDATION WALLS.

THERE is frequently asked a question in regard to stopping earthen pipes outside the foundation walls which is now always answered in a satisfactory manner. A man laying earthen pipe, unless he has strict orders to the contrary, is inclined to carry it to the inside face of the foundation. When left in this condition, the plumber carries his house drain into the earthen sewer, covers the joint with a good supply of cement (which in a great many cases only covers the upper half of the pipe), and the work is considered complete. Then follows the mason who points up the opening made in the stone work, very much as we have shown in Fig 1. There is no fault to be found with this at the



PIPS AT FOUNDATION WALLS. FIG. 1.—UNSAFE CONNECTION.

time of construction, provided the plumber has succeeded in making a tight joint between the earthen and iron pipe.

If the house has an area, as shown in Fig 2, the earthen pipe or house sewer is usually brought inside the area wall and left nearly flush with the outside wall of the foundation. The concrete of the area is laid down over the earthen pipe, and the area wall is pointed up. This is, like the former, a good job while it is new, but it is very objectionable when carried out in the way shown for this reason: The excavation is always made somewhat larger than the wall, and the wall itself, sitting on fresh soil, is liable to settle. Even the light area walls have considerable movement. In addition to this, the dirt behind them (as shown in the figures) is loose, and after rains usually goes down sometimes to the extent of several inches. The walls being cemented close around the earthen pipe, go down with the dirt, and the result is either the cement around one of the joints of the house sewer is split or broken or the pipe itself breaks. This break being on top is not readily discovered, but at the most dangerous place in the whole house it permits the entrance of foul gases into the basement of the building from which they will be carried by the natural currents into all parts of the house. In case there is an area the danger is usually quite as great, because the area wall is built with less care, and

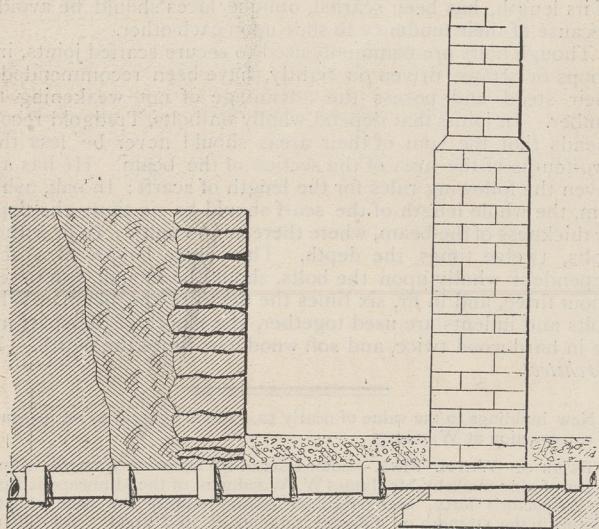


FIG. 2.—ANOTHER UNSAFE CONNECTION.

settlements under the action of frost and rain are much more common than in foundations. These settlements are also greater in extent. It was probably for this reason that the New York city plumbing rule calls for the iron pipe to extend two feet outside of the outside face of foundation or area walls through which the pipe passes.

In cities where earthen house drains, as well as earthen sew-

ers are allowed, the trouble from settlement is just as great as in the two cases mentioned. But it is possible to overcome this difficulty if proper precautions are taken. These precautions are simple and not at all costly. If the pipe passes through an opening so arranged that the settlement of the wall cannot affect the pipe, the object is accomplished. If, as in Fig 3, at the foot of the foundation wall a flag stone, or other foot stone is arranged, so as to support the wall, at the same time leaving an opening for the pipe to pass through, the settlement will be provided for without throwing any pressure upon the pipe at one

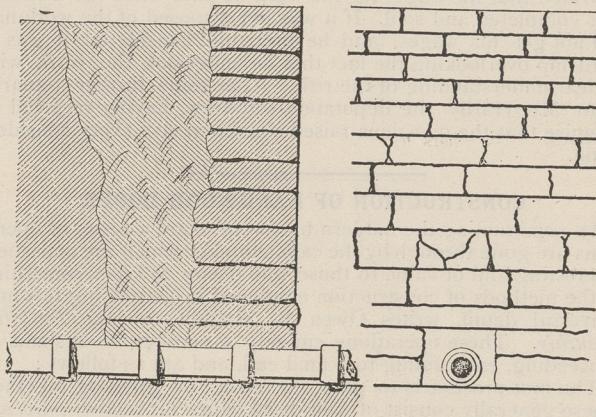


FIG. 3.—A SAFER METHOD.

point, and the pipe, not being disturbed, will be safe. This precaution can be taken at area walls equally well, and the result is the safety of the pipe at a critical point. When pointing it must be kept in mind when carrying the pipe through a wall in this way, that is, if the hole where the pipe comes through is cemented up solidly, as is sometimes done, the advantage of having an opening or arch which might be used instead of the flat stone, all the advantages will be destroyed. Hence this opening should be filled up loosely and only the very face of the wall closed with cement in sufficient quantity merely to keep out vermin.—*Metal.*

INSANITARY CONDITIONS IN MONTREAL.

MR. R. P. Fleming, speaking as to the sanitary conditions in Montreal, says that the serious defects found in houses examined for the first time reaches 83 per cent. The inspection referred to was among large houses in the best part of the city, so that this gives no idea of what may exist among smaller properties where the inhabitants have to depend upon the owners and authorities for a proper condition of things. In his report to the Montreal Sanitary Association on this subject, Mr. Fleming particularizes cases of defects of various characters, such as bad plumbing and pipe laying, but in almost all the cases sewer gas has direct access to the interior of the houses. It is surprising that such a state of things could possibly exist in a city like Montreal. In a large house in the best part of the city the soil pipes were found simply laid in without any jointing of any kind, and one two-inch pipe, perfectly open at the end, was discharging volumes of sewer gas into the house. Besides this the cess pool was situated directly under the kitchen where the servants lived, worked and cooked. The report closes by calling upon the association to take further steps to urge the City Council to provide proper inspection and supervision of all sanitary arrangements. It is hoped the petition which the Sanitary Association have prepared, when presented to the Council, will be acted upon.

PUBLICATIONS.

A number of the best designs submitted in the recent Presbyterian church competition, accompanied by descriptions, essays on church architecture, etc., will be published shortly in pamphlet form.

We have received from Mr. Samuel Cabot, the well known manufacturer of shingle stains, an artistically colored lithographic view of his factory in Boston, Mass., which is described as being the largest establishment of its kind in the world.

The *Cosmopolitan Magazine* scores a success in producing in its May number, almost simultaneously with the daily papers, an elaborate description of Professor Gray's marvellous invention, the Telautograph, which reproduces the handwriting, or the work of the artist, simultaneously, thousands of miles distant from the place where the writer or artist is sitting.

The Sunshine Publishing Company of 402 Race street, Philadelphia, have published a work entitled the "History of the Master Builders' Exchange of the city of Philadelphia." The work is compiled for the historical committee of the Exchange by Clem. H. Congdon, and gives an interesting and concise account of the institution since its organization in 1886. The leaves of the book are intersected with over 50 illustrations dealing not only with matters relating to the Exchange, but also by a series of good cuts taken from photos of models exhibited at the Paris Exhibition in 1889, showing the different class of habitations in the principal countries of the world. The book should be in the reading room of every Builders' Exchange.

At the recent examinations of the Toronto Technical School, Messrs. W. D. Wilkinson, G. R. Groth, R. W. Ferguson, L. Johnson, D. Eagle, E. Sauton, E. Cannon, E. H. Richards, and F. R. Love were successful in the subject of Architectural Drawing, and Messrs. W. E. McMullen and G. R. Groth, in Perspective Drawing.

MANUFACTURES AND MATERIALS

LIME AND CEMENT.

THE powder produced from pure and impure limestone by means of heat is called lime or cement, and, as materials used in the masons' and builders' art, they are classified as common or fat lime, hydraulic lime and hydraulic cement. Good lime is in hard lumps, free from cinders, clinkers, much dust, and should form a very smooth paste when slacked. The limestone from which common lime is obtainable is very seldom pure, and contains magnesia, alumina, silica, and similar impurities to the amount of from 3 to 10 per cent. The paste it makes is greasy, from which fact it is known as "fat." It is sometimes called "air-lime," as it will not harden unless it is exposed to the air, and, if mixed with water, it can be kept for an indefinite period without loss of its qualities, provided it is kept from contact with the atmosphere.

Hydraulic lime differs from common lime in that it will harden under water, which is on account of its clayey or flinty nature. When burnt it becomes a caustic lime, and on being brought into contact with water is hardened, its hydraulicity being produced by the crystallizing elements of the clay and flint in the lime. This lime is imported in large quantities from France, but an artificial material of this class can be made by mixing unburnt clay with common lime or a powdered limestone, burning in the shape of bricks by means of a common kiln, slackening the material in the ordinary way, care being taken that there are no lumps of clay still unburnt.

Hydraulic cements are of three kinds, viz.: Portland, Rosendale, and Pozzuolana, but the last named is seldom used, as the strength of the cement is much less than others of this class. It, however, is an ancient cement, being used prior to the Roman age, and it was the first cement known to possess the property of hydraulicity. Its name is taken from the place where it was first found, viz., Pozzuoli, in Italy.

Rosendale cement, sometimes called "natural" or "American," is found and largely used in the United States. The natural bed of limestones from which this cement is made covers about one-third of the State of New York and other parts of the country, and is of a clayey, magnesium nature, light and quick setting.

Portland cement obtains its name from its resemblance when made in a hardened mortar to stone found on the isle of Portland, off the south of England. It was first made in that country in 1843, and in America in 1874, and is heavy, slow setting and of great ultimate strength. The natural stone from which the original Portland cement is made contains 20 to 22 per cent. of clay and 78 to 80 per cent. of carbonate of lime, and its superiority is increased by the intensity and duration of the heat employed in burning, which is almost to the limit of vitrification. Artificial Portland cement is very largely used, and about nine out of every ten of this class of cement now in the market are not the genuine article. Some of these cements, however, are equal to the best imported Portland, and with proper care a still better cement might be obtained. It is generally made by mixing in proper proportions clay and chalk, marl or compact limestone, and burning them at a high heat.

The testing of cements is an important matter, as their values vary to a large extent, and the natural properties of one portion of a cement are liable to differ from another portion, although of the same brand. Particular attention should be paid to the soundness, fineness and strength of a cement. It should be sound, so as not to expand or contract in setting, which is caused by active lime or magnesia being in the material. The presence of such impurities can be proved by immersing in water some cement mortar with very thin edges, and on examination after say two days, the material

will be found contorted and cracked at the edges. The magnesia is more harmful than the cement, for the latter can be slackened by exposure to the air. Many defects in masonry buildings of recent years have been caused by the hydration of magnesia in the cement. It is well to remember in testing the soundness of cements that the trial should extend over considerable time, for some defective material will stand for a period, and then lose its unity and fall to pieces.

Fineness in cement is essential from a point of economy, for the finer the cement the greater will be the surface it will cover. It should also be borne in mind that cement will not crystallize by the addition of water unless it is ground, because the coarse particles have no binding power. In order to determine the fineness of the material, sieves are employed with a certain number of meshes to the square inch—one with 50 is considered a good test, and the cement that passes through is of a recommendable fineness.

The strength of cement is usually determined by submitting a specimen in solid form to a tensile strain, for should it pass this test the compression will also, as this material is not so strong in tension as in compression. The committee of the American Engineering Society recommend that the tensile stress applied should increase at the rate of 400 lbs. per minute.

There are other properties, such as color and weight, which are often tested when determining the value of cements, but they are not of so much importance as the matters already referred to. Color indicates the difference in the character of the rock and amount of burning. Gray or greenish is considered a good color, while bluish gray indicates a probable excess of lime, and brown the presence of much clay. American cements are peculiar in respect of color, they generally being of a light or dark brown shade.

Weight of cement varies according to the heat given in burning, fineness in grinding and density of packing. The harder a material of this class is burnt the more it weighs. The time a cement takes to set may be also considered a test as to its quality, and one that sets in 30 minutes or fails to commence to do so within three hours, reckoned from the time the water is poured upon the cement, should not be used.

DUTY ON CEMENT.

Deputations representing the manufacturers of Canadian cement and the Canadian importers of foreign cement have recently waited upon the Government with reference to the import duty of 40 cents per barrel. It is the desire of the former that the duty be allowed to remain as at present, while the latter urge that cement be placed on the free list. The imports of cement into Canada last year amounted to 185,000 barrels, while the amount produced in Canada reached 45,000 barrels. The Canadian manufacturers say that if the duty is retained they will soon be able to supply entirely the Canadian market.

Messrs Carroll, Vick & Co., of Toronto, having discovered in abundance on their property at the Forks of the Credit the materials necessary to the production of fire and paving bricks, will shortly enter into these lines of manufacture.

A manufacturer of British Columbia shingles who has recently made a tour of Manitoba, Eastern Canada, and the new England States is quoted as having said that in Ontario people have not yet discovered that it is cheaper to pay a little more for British Columbia shingles and have a good roof for years, than to buy cheap pine shingles, and have to repair continually. A considerable disparity in price as compared with the product of eastern mills is unavoidable so long as the cost of freight remains as high as at present. On the other hand British Columbia shingles are being sold at slaughter prices in Winnipeg and throughout Manitoba, while the American duty is such as to render it impossible to compete with United States mills in the American market.

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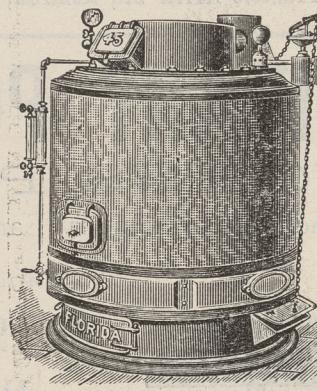
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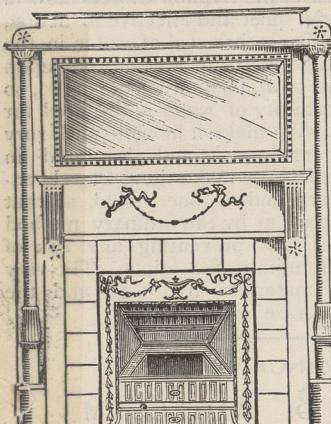
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SHAVINGS.

The Toronto Roofing company has assigned to Mr. W. A. Campbell, liabilities \$1,700, assets \$900.

An exhibition composing virtually a history of ecclesiastical art, is to be held in London, England, this year.

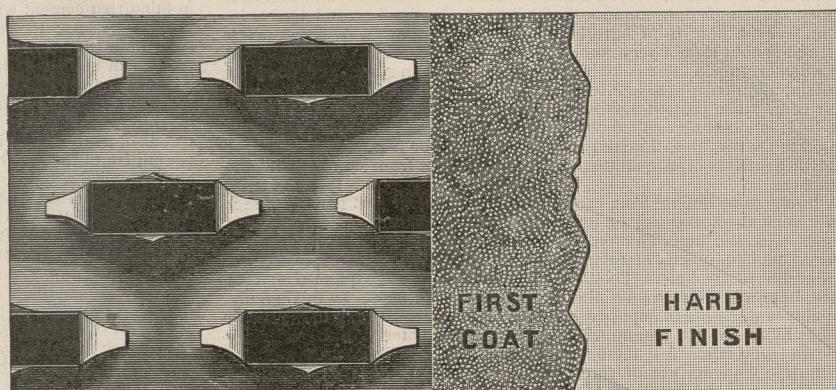
Knox church at Montreal is to be superseded by a new structure. This church was organized 107 years ago, and its first place of worship was erected in 1792 at a cost of \$5,250. In 1865 a new edifice was built, and this is now to be pulled down for a new and more imposing structure.

The Master Stonecutters' Section of the Toronto Builders' Exchange have renewed their agreement with the journeymen masons. It is to continue in operation for three years, and the wages to be paid are fixed at 43 cents per hour. Representatives from both parties are to hold a meeting four months before the agreement expires to discuss how the trade stands, and three months notice must be given by either parties before the expiration of the three years if it is their intention not to renew the agreement.

The Confederation Life Association's new building in Toronto was formally opened on the 10th inst. by a luncheon which was attended by many of the prominent business and professional men of the city. The new building, which was the subject of much favorable comment, has cost up to the present about \$420,000, and it is estimated that not more than \$50,000 additional will be required to be expended for its completion, thus bringing the total cost within half a million dollars. The slow burning principle of construction has been employed.

The Canadian Society of Civil Engineers have appointed the following officers: President, E. F. Hannaford, Montreal; vice presidents, Thomas Munro, Coteau Landing; P. A. Peterson, Montreal; and W. T. Jennings, Toronto; Treasurer, H. Wallis, Montreal; Librarian, William McNab, Montreal. The council also includes H. T. Barrey, St. George Montreal; Boswell, Quebec; H. D. Lumsden, Toronto; P. W. St. George, Montreal; J. D. Barnett, Stratford; Alan Macdougall, Toronto; G. C. Cunningham, Montreal; G. A. Mountain, Ottawa; C. K. Domville, Hamilton; C. H. Keefer, Toronto; H. S. Poole, Stellarton; T. Ridout, Ottawa; F. R. F. Brown, Moncton, N. B.; E. Mabun, Victoria, B. C.; F. R. Redpath, Montreal.

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